

2.2 Aggregate demand and aggregate supply

Learning Outcomes

- Distinguish between the microeconomic concept of demand for a product and the macroeconomic concept of aggregate demand.
- Construct an aggregate demand curve.
- Explain why the AD curve has a negative slope.
- Describe consumption, investment, government spending, and net exports as the components of aggregate demand.

Subject vocabulary

price level the current weighted average price of a selected group of goods and services produced in a country over a period of time

final goods a finished good that does not require further processing

capital (goods) manufactured goods that are used in the production of other goods

productivity the quantity of output per unit of input

government expenditure spending by a government in a specified period of time on such things as transport infrastructure, welfare payments, national defense, education, and health services which is financed by tax revenue and borrowing

direct taxes a tax that is paid directly by an individual or firm to the government. For example income tax on wages and company profits.

tax revenue the income the government receives through the levying and collection of taxes

national debt the total amount of money a government has borrowed. When a government runs a budget deficit it must borrow the difference thereby adding to the national debt

ceteris paribus Latin phrase meaning 'all other things being equal' or 'all other things being held constant'

Distinguish between the concept of demand and the concept of aggregate demand

In microeconomics demand is a measure of the quantity of goods and services an individual consumer or all the consumers in a particular market are willing and able to buy at a range of prices. Aggregate demand (AD) is the sum of all demand for goods and services in a country at a given **price level** during a given time period. In other words AD is the sum of all expenditure in a country at a given price level usually measured over a period of one year. Total expenditure, which is the sum of all demand in a country (AD), is equal to GDP.

In microeconomics the demand curve diagram shows the price of a good on the y axis and quantity of that good on the x axis shows. The aggregate demand diagram shows the average price level on the y axis and the total quantity of all goods and services on the x axis. The total demand is national output. National output (real GDP) = national expenditure = national income.

Describe the components of aggregate demand

AD is the total expenditure on goods and services. Expenditure comes from four sources.

Consumption (C) by households of domestically produced goods and services. Consumer goods or **final goods** can be durables meaning the goods last a relatively long time, such as electronic goods or non-durables such as food and writing paper, which are consumed relatively quickly and are purchased again in the short term.

Investment (I) by firms on domestically produced **capital** goods and services. Investment is the addition to capital stock. Firms have to invest in new capital when current capital wears out. This is called replacement investment. The firm must buy new capital to continue to supply output at current levels. Firms usually replace old capital with more technologically advanced capital thereby potentially increasing **productivity**. A firm also buys capital in order to increase output in response to an increase in demand or when demand is expected to rise. Therefore as AD rises or if firms expect AD to increase in the future firms in the country increase investment. This is called induced investment.

Government expenditure (G) on goods and services. A recession is characterized by falling incomes and expenditure. Therefore **direct tax** and indirect tax revenues fall. Unless the government borrows from the financial markets government expenditure will fall. A booming economy is characterized by rising incomes and expenditure therefore **tax revenues** increase and the government is able to increase expenditure. Alternatively a government might decide to pay back some of the **national debt** rather than increase expenditure.

Net exports (X-M) is expenditure on exported goods and services minus expenditure on imported goods and services. When expenditure by foreigners on domestically produced goods and services rises, **ceteris paribus**, net exports will rise. Whereas when expenditure rises on imported goods net exports fall.

Model sentence: $AD = C + I + G + (X - M)$

Why does the aggregate demand curve have a negative slope?

The price level is the average price level of all the goods and services in a country. A positive **inflation rate** causes the average price level to increase. Inflation reduces the **purchasing power of nominal income** therefore consumers can buy fewer goods. A negative inflation rate, which is called deflation, causes the average price level to fall. Purchasing power increases and consumers can buy more goods. Therefore as the price level rises, *ceteris paribus*, the total demand for goods and services in the country falls. When the price level falls total demand for goods and services in a country increases. The AD curve **slopes** downwards because there is a negative or inverse relationship between the price level and **real GDP**. In Figure 44.1 as the price level falls from PL_1 to PL_2 national output increases from Y_1 to Y_2 .

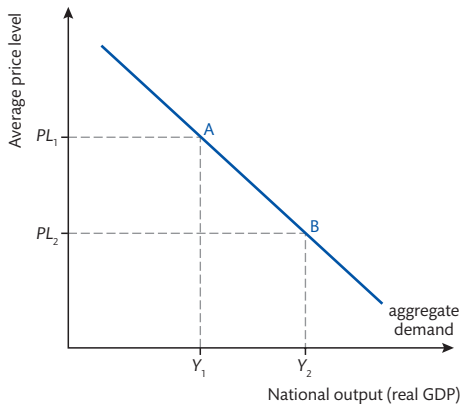


Figure 44.1

Model sentence: A change in the price level leads to a change in the purchasing power of consumer income causing a change in AD and a movement along the AD curve.

Test your understanding of this unit by answering the following questions

- What is aggregate demand?
- Explain the cause of a movement along the aggregate demand curve.
- Distinguish between durable and non-durable goods.
- Distinguish between replacement investment and induced investment.
- Explain the term 'net exports'.

Subject vocabulary

inflation rate the rate at which a weighted average price of a basket of goods and services is rising measured in percentage terms

purchasing power a measure of how many goods and services a given amount of money can buy

nominal income the numerical value of income which has not been adjusted to take into account the effect inflation has on the purchasing power of income

real GDP the value of all output of an economy produced in a given period of time, usually a year, adjusted to take into account the effect of inflation

interest rate the percentage amount charged by a lender for money borrowed

unemployment occurs when there are people actively looking for work at the equilibrium wage rate but are not able to find work

Learning Outcomes

- Explain how the AD curve can be shifted by changes in consumption due to factors including changes in consumer confidence, **interest rates**, wealth, personal income taxes (and hence disposable income), and level of household indebtedness.
- Explain how the AD curve can be shifted by changes in investment due to factors including interest rates, business confidence, technology, business taxes, and the level of corporate indebtedness. Explain how the AD curve can be shifted by changes in government spending due to factors including political and economic priorities.
- Explain how the AD curve can be shifted by changes in net exports due to factors including the income of trading partners, exchange rates, and changes in the level of protectionism.

Explain the causes of changes in consumption

Discussed below are the determinants of aggregate demand. A change in a determinant of AD, *ceteris paribus*, changes the total amount of goods and services consumed at each price level in a country in a given period of time.

Changes in confidence affect consumers' willingness to buy goods and services

If the economy is entering a recession and firms begin to lay workers off some people will be worried that they might become unemployed. The threat of **unemployment** is enough to change the behaviour of consumers. Consumer expectations concerning future levels of income plays an important role in consumption decisions. Fear of unemployment and falling income in the future leads consumers to postpone consumption today, particularly consumption of luxury goods with relatively high **income elasticity of demand**. If consumers expect the economy to take a **downturn** the demand for goods and services such as foreign holidays and new cars falls. Consumers postpone consumption until expectations about future economic activity improve. If households feel optimistic about economic growth and believe employment is secure and that incomes

Subject vocabulary

income elasticity of demand a measure of how quantity demanded responds to a change in income in percentage terms

Glossary

slope the angle/gradient of the curve

Synonyms

downturn..... decline/fall

Subject vocabulary

loan repayment money paid back by the borrower of the loan to the lender

durable goods type of final good that is consumed over a relatively long period of time. It is not consumed in one use. The consumer gains benefit from its use over time.

financial capital the money used by firms and entrepreneurs to purchase the resources needed to produce goods or services

inverse relationship a change in the value of one variable leads to an opposite change in direction in the value of the other variable. For example an increase in price leads to a fall in quantity demanded.

mortgages loans that are secured against property

asset an item of value owned by an individual or firm, especially one that could be converted to cash

share a unit of ownership of a company's capital. The owner is entitled to a proportion of the company's profit.

government bonds issued by the government to investors in exchange for lending it money. The investor is entitled to interest payments on the loan as well as repayment of the loan when the bond matures

income tax a direct tax on individual earnings (wages, rent, profit, interest) and paid to the government

disposable income household income after direct taxation has been deducted

savings income that is not spent

interest rate the percentage amount charged by a lender for money borrowed or paid to a person for saving money

Synonyms

shift(s) move(s)

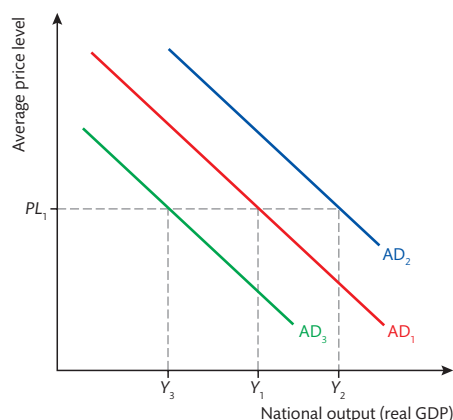


Figure 45.1

Changes in the interest rate particularly affect the consumption of relatively high-priced durable goods

Consumers often borrow to buy **durable goods** such as cars, televisions, lap top computers, carpets, furniture, and so on. Consumers borrow in order to bring forward consumption. Consumers who borrow from a bank must pay back the **financial capital**, which is the actual amount of money borrowed, and the interest charged on the capital.

The interest is the price of money. It is the price the consumer pays in order to have the money now. The interest payable on a loan is calculated as a percentage of the amount of money borrowed. A consumer wants to buy a car and borrows \$10,000 over a period of a year at an interest rate of 5%. She has to pay back to the bank by the end of the year the capital amount borrowed, which is \$10,000 plus the interest which is \$500, a total of \$10,500. If the interest rate is 15% then interest payment on the loan would be \$1500. An increase in the rate of interest, *ceteris paribus*, effectively increases the price the consumer pays for the car. Therefore there is an **inverse relationship** between interest rates and consumption. Also as the interest rate falls repayment on existing loans such as **mortgages** falls leaving households with more of their income to spend on goods and services.

Model sentence: As the interest rate increases, *ceteris paribus*, consumption at each price level falls and the AD curve shifts down and to the left. As the interest rate falls consumption at each price level rises and the AD curve shifts up and to the right.

Changes in wealth affects total consumption in a country

Wealth is the value of the **assets** or possessions owned by a household less household debt. Real or physical assets include houses, jewellery, gold, and works of art. Financial assets include **shares** in companies, **government bonds**, savings accounts, and pension funds. It is the value of houses and shares that has the greatest impact on consumption. When house prices fall the value of the consumers' main asset falls and this affects confidence. Consumers are likely to reduce consumption. If house prices rise consumers grow in confidence, they feel wealthier and are likely to increase consumption. As the price of shares held by a household increase the household feels wealthier and more confident. Again this will lead to increases in consumption.

Model sentence: *Ceteris paribus*, when the value of household assets change the total demand for goods and services in a country changes at each price level causing a shift of the AD curve.

Changes in income affects total consumption

As an economy grows national income increases and consumers can buy more goods and services at each price level and the AD curve shifts up and to the right. The extent to which increases in income affect consumption of domestically produced goods depends on a number of factors.

If **income tax** increases then households' **disposable income** falls leaving less to spend on goods. If income tax rates fall disposable income rises therefore consumption will increase and the AD curve shifts up and to the right.

If the interest paid by the banks on household **savings** increases the incentive to save increases. Households save more of their income and spend less on consumption. *Ceteris paribus*, consumption falls as the **interest rate** on savings increases and the AD curve shifts down and to the left.

may rise in the future people are more likely to be willing to bring consumption of such goods forward. Consumers are more likely to borrow money from a bank to buy higher priced goods because they are confident that they can afford the **loan repayments**.

When expectations are positive, consumption at each price level increases leading to a **shift up** and to the right of the AD curve from AD_1 to AD_2 and when consumers have negative expectations about the future state of the economy consumption at each price level falls and the AD curve shifts down and to the left from AD_1 to AD_3 as shown in Figure 45.1.

If demand for **imported goods** increases then households have less income to spend on domestically produced goods therefore total consumption falls.

Model sentence: The amount of income households spend on goods and services in an economy is dependent upon the **rate of tax**, the interest rate, and the proportion of income spent on imports.

The level of household indebtedness affects total consumption in a country

Household indebtedness is a measure of the amount of money households owe lenders of money such as banks. It includes money owed on credit cards, and loans from a bank borrowed to finance expenditure on durable goods. As households borrow to buy, indebtedness increases and consumption rises. Debts must be repaid out of future income. Therefore increased indebtedness now reduces the amount of income in the future available for consumption. If a person expects future earnings to increase he is more likely to increase indebtedness now believing that the debt can be repaid in the future. If expectations concerning income in the future are less positive then households are less likely to build up personal debt thereby reducing current consumption. Also, when households are worried about future income, expecting it to fall, they will pay back more of their debt thereby reducing current consumption.

Explain the causes of changes in investment

Discussed below are factors that affect the level of investment in an economy.

National income

Investment is the addition to **capital stock**. It is an injection into the **circular flow of income**. Firms invest in order to replace worn out capital, to increase **productivity** and to expand production. As **national income** rises consumption increases. Firms work their capital harder and for longer periods in order to keep up with demand. Therefore capital wears out more quickly and will need replacing more often. This is called replacement investment. As AD continues to increase and expectations are that AD will rise further in the future firms buy more capital in order to increase future potential levels of output. This is called **induced investment**.

Business confidence

Business confidence concerning economic growth and future levels of AD affect the amount of induced investment in a country because in order to meet potential higher levels of demand and to earn the greater profits available the firms must be able to satisfy that demand. If the economy enters a recession and it is expected to be a long and deep one national income and consumption falls along with business confidence causing a fall in both replacement and induced investment.

Technological change

The use of **technologically advanced capital** increases productivity and reduces the average cost of production. When there is technological change in the state of capital firms must buy it in order to remain competitive both domestically and internationally. If a firm fails to invest in the technologically advanced capital while others do its average costs will be higher than its competitors and profits lower. It is likely that the firm would not survive in the long term because at some point **market price** will fall below the average cost.

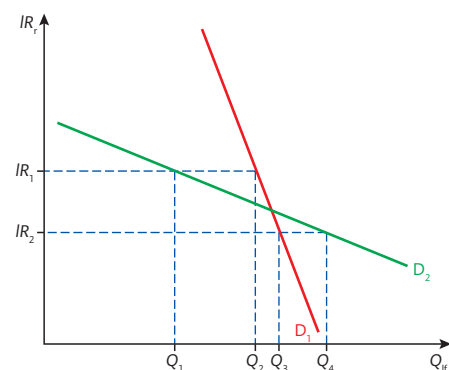


Figure 45.2

The rate of interest

Investment comes from two sources. Either the firm uses some of its **retained profit** or it borrows. If the interest rate changes the cost of borrowing changes. As the cost of borrowing rises, *ceteris paribus*, investment falls. As costs fall investment rises. As the cost of an investment increases, *ceteris paribus*, the potential profit earned on the investment falls thereby reducing the incentive to invest. Also as interest rates rise the **opportunity cost** of the investment increases because the money could earn relatively higher **returns** simply deposited in the bank. There is a **negative relationship** between interest rates and investment as shown in Figure 45.2.

Subject vocabulary

imported goods goods sold into a country from another country

rate of tax the percentage at which an individual's income or expenditure and a firm's profit and expenditure is taxed

capital stock the total amount of physical capital that exists in a firm, industry or economy at a given moment in time

circular flow of income an economic model that shows the flow of money between households and firms and, in more complex versions, the flows of money into and out of the financial sector, government sector, and the international sector

productivity the quantity of output per unit of input

national income the sum of all income earned in a country in a given period of time

induced investment investment by firms that is caused by increases in consumption. As aggregate demand increases, and is forecast to continue to rise, firms need to increase the quantity of capital in order to meet future levels of demand.

technologically advanced capital capital that incorporates new technology and is used in place of existing capital to produce goods and services thereby increasing productivity

market price the price determined by the interaction of demand and supply in a competitive market

retained profit after-tax profit that is not paid out to shareholders but is kept by the firm to be reinvested in the business or used to pay back debt

opportunity cost the next best alternative forgone

return profit earned from an investment

negative relationship a relationship between two variables in which one variable falls as the other increases and rises as the other falls

Subject vocabulary

loanable funds the sum of money in an economy that is saved rather than used for consumption and made available to those wishing to borrow

corporation tax a tax levied in the UK on company profits

debt an amount of money that is owed

private sector the part of the economy that is regulated but not controlled by the state and concerns individuals and groups bringing together the factors of production normally with the aim of making a profit

public expenditure money spent by government

budget deficit occurs when government expenditure is greater than tax revenue

national debt the total amount of money a government has borrowed. When a government runs a budget deficit it must borrow the difference thereby adding to the national debt

fiscal policy government policy designed to achieve macroeconomic objectives through government expenditure and taxation

recession two consecutive quarters of negative economic growth

tax revenue the income the government receives through the levying and collection of taxes

Glossary

infrastructure the basic structure/systems of a country (e.g. roads/railways)

The demand for **loanable funds** curve D_1 is relatively inelastic with respect to interest rates. This means quantity demanded of funds for investment is insensitive to changes in the rate of interest.

Whereas D_2 represents a situation where quantity demanded of investment funds is relatively elastic with respect to interest rates. This means quantity demanded of loanable funds is sensitive to changes in the rate of interest.

Model sentence: If firms expect future levels of aggregate demand to fall the effect on investment from a fall in interest rate will be minimal thus the demand for investment funds will be highly inelastic.

Firms pay tax on profits earned. Business taxes, such as **corporation tax** which is a tax on company profits, affect the quantity of investments. As tax rates fall, after-tax profits rise leaving the firm more retained profit to invest. Also lower taxes act as an incentive for firms to invest because firms can keep more of the profit thereby increasing the return on any investment. Relatively high taxes act as a disincentive to invest because high taxes reduce potential returns on any investment.

The level of corporate indebtedness

Firms' indebtedness is a measure of the amount of money firms owe lenders of investment funds such as banks. As firms borrow to invest, indebtedness increases and investment in the country rises. **Debt** and interest on the debt must be repaid out of future profit. Therefore increased indebtedness now reduces the amount of profit in the future available for investment. If firms expect future profits to rise they are more likely to increase indebtedness now believing that the debt can be repaid in the future. If expectations about profits in the future are low then firms are less likely to build up debt by borrowing to invest thereby reducing current levels of investment. Also, when firms expect profits to fall in the future they might pay back debt now thereby leaving less retained profit for current investment.

Explain the factors that affect government expenditure

According to the 2011 'Index of Economic Freedom' many European countries have relatively high levels of government expenditure as a percentage of GDP. In the UK government expenditure accounts for 47% of GDP. In Belgium, France, and Sweden government expenditure accounts for just over 50% of GDP. In countries such as these the governments provide many goods and services including healthcare and education for all the citizens, as well as spending on transport **infrastructure**, social housing, and national defence. Also government subsidizes industries in the **private sector** using taxpayers' money.

Through taxes on goods and services such as VAT, and taxes on income the government raises the government revenue needed to finance expenditure. Many countries where **public expenditure** is relatively high run a **budget deficit**. This occurs when government expenditure exceeds tax revenue therefore the government must borrow the difference from the financial institutions and doing so increases the **national debt**.

Citizens in many countries expect the government to provide lots of services while at the same time are not always happy to pay more tax to fund the expenditure. Political parties in countries have different views on the role of government in an economy and society and it is these views that can affect **fiscal policy** when in government. Nevertheless, whatever the political party that forms the government its expenditure makes a significant contribution to overall consumption.

Increasing government expenditure increases AD and national income. This can lead to increases in consumption by households and investment by firms. Unemployment falls leading to further increases in consumption. In this way government expenditure could bring an economy out of **recession**. However, in a recession **tax revenue** is low so the government will have to borrow to expand expenditure increasing the national debt. This debt, plus the interest paid on it, must be repaid in the future by the next generation of tax payers. Taxes will have to be higher in the future thereby reducing the disposable income of those households. However, it can be argued that when the economy grows tax revenues increase and the government should be able to pay off at least some of the national debt.

It can be seen that fiscal policy has a major impact on changes in aggregate demand. Increases in government expenditure shift the AD curve up and to the right and decreases shift the AD curve down and to the left. Reductions in tax increase disposable income and increase consumption causing a shift up and to the right of the AD curve.

Model sentence: The aim of **expansionary fiscal policy** is to increase aggregate demand by reducing the rate of tax and increasing government expenditure. The aim of **contractionary fiscal policy** is to reduce aggregate demand by increasing the rate of tax and reducing government expenditure.

Explain how changes in net exports affect aggregate demand

Increases in **international trade** means that most countries import and export both **consumer goods** and services and **capital** goods and services. A **current account deficit** occurs when expenditure on imports exceeds expenditure on exports and a current account surplus occurs when expenditure on exports exceeds expenditure on imports. A deficit reduces GDP and a surplus increases GDP.

Expenditure on imports is a leakage out of the circular flow of income and expenditure on exports is an injection. When consumers switch expenditure from domestically produced to imported goods the current account deficit increases or the surplus is reduced and AD falls. As expenditure on exports increases the deficit falls or the surplus increases and AD rises.

Ceteris paribus, when national income increases in a country expenditure on imports rises increasing the leakages from the circular flow of income, worsening the deficit or reducing the surplus on the current account. Demand for exports rises when the national income rises in a foreign country. Foreigners will buy more of another country's exports, increasing the flow of income injected into the economy and improving its current account balance.

The **exchange rate**, the price of one currency in terms of another currency, in a floating exchange rate system fluctuates over time and this affects the price foreigners pay for imports. For example, when the £ appreciates against the \$ UK exports to the US become more expensive. The price in \$ US citizens pay for UK goods increases therefore **quantity demanded** falls and the US consumers buy fewer UK goods; thus expenditure on UK exports to the US falls reducing aggregate demand in the UK. The opposite occurs when the £ falls in value against the \$.

If a government wants to protect **domestic firms** from international competition it can for example give subsidies to domestic producers and place a **tariff** on imported goods. A tariff is a tax on goods coming from abroad. It increases the price of imports thereby reducing the quantity demanded. Consumers switch expenditure away from imported goods towards domestically produced goods thus increasing AD and improving the current account deficit. Of course other countries can retaliate by placing a tariff on goods imported in from the competitor country.

The inflation rate is a measure of the increase in prices over a given period of time. As prices rise in a country exports become less price competitive and quantity demanded falls leading to a fall in AD. If a country's inflation rate is relatively low then it will have an advantage in international trade as the relative price of imports increases and price of exports falls. Quantity demanded of exports increases and quantity demanded of imports falls improving the current account balance and boosting AD.

Model sentence: The exchange rate, inflation rate, **protectionism**, and levels of national income all affect the quantity demanded of imports and exports thereby affecting the value of **net exports** and aggregate demand.

Test your understanding of this unit by answering the following questions

- Explain why the quantity demanded of loanable funds might be insensitive to a change in the interest rate.
- Discuss the significance for economic growth of consumer and producer confidence.
- Using an AD diagram, explain the effect on a country's AD of an increase in its national income.
- Explain how indebtedness affects AD.
- Explain the effects on AD of an expansionary fiscal policy.

Subject vocabulary

expansionary fiscal policy policy involving the increase of government spending and/or the reduction of taxation

contractionary fiscal policy government policy designed to eliminate an inflationary gap through increasing taxes and/or reducing government expenditure

international trade the cross-border exchange of goods and services

consumer goods goods that are ultimately consumed by households rather than goods used by firms in the production of another good

capital (goods) manufactured goods that are used in the production of other goods

current account deficit occurs when the amount of money flowing out of a country from the trade in goods and services, investment income, and transfers is greater than the amount flowing in

exchange rate the price of a country's currency in terms of another currency

quantity demanded the amount of a good consumers are willing and able to buy at a given price over a given period of time

domestic firm a firm that produces its output in the home country

tariffs a tax placed on imported goods and services

protectionism government policies, including tariffs, quotas and subsidies, that restrict the extent of international trade and which are implemented in order to protect domestic industries from cheaper imports

net exports export revenue minus import expenditure

Learning Outcomes

- Describe the term aggregate supply.
- Explain, using a diagram, why the short-run aggregate supply curve (SRAS curve) is upward sloping.
- Explain, using a diagram, how the AS curve in the short run (SRAS) can shift due to factors including changes in resource prices, changes in business taxes, subsidies, and supply shocks.
- Explain, using a diagram, that the monetarist/new classical model of the long-run aggregate supply curve (LRAS) is vertical at the level of potential output (full employment output) because aggregate supply in the long run is independent of the price level.
- Explain, using a diagram, that the Keynesian model of the aggregate supply curve has three sections because of 'wage/price' downward inflexibility and different levels of spare capacity in the economy.
- Explain, using the two models above, how factors leading to changes in the quantity and/or quality of factors of production (including improvements in efficiency, new technology, reductions in unemployment, and institutional changes) can shift the aggregate supply curve over the long term.

Subject vocabulary

aggregate supply the total supply of goods and services produced in an economy at a given price level in a given time period

aggregate supply curve

a graph that shows the relationship between the average price level and aggregate supply

supply curve a graph that shows the relationship between price and quantity supplied

price level the current weighted average price of a selected group of goods and services produced in a country over a period of time

real output the quantity of goods and services produced in a given time period

costs of production the amount the firm pays for the factors of production used to produce goods or services

overtime time spent working in addition to normal working hours

wage rate the amount of money paid to labour per unit of time or unit of output

total cost the sum of total fixed cost and total variable cost

average cost is equal to total cost divided by quantity of output

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Synonyms

shift(s) move(s)

What is aggregate supply (AS)?

Aggregate supply is the sum of the amount of goods and services all industries in a country are willing and able to supply at each price level. The **aggregate supply curve** is the addition of all the **supply curves** of all industries in a country. Aggregate supply is measured both in the short run and in the long run.

Why does the short-run aggregate supply curve (SRAS curve) slope upwards?

The SRAS curve is drawn showing the relationship between the **price level** and **real output** while holding all factor prices constant. When firms increase output they incur higher total **costs of production**. The firms, for example, have to employ more workers and pay workers **overtime** or some form of bonus payments in order to increase output in the short run. Although the **wage rate** has not increased firms' labour costs increase therefore **total cost** and **average cost** increase. (HL students see pages 65–66 for an explanation of how marginal cost and average cost increase because of the law of diminishing returns to the variable factor.) In order to maintain **profit margins** firms increase prices thereby passing the higher costs on to the consumers. Therefore as firms in the economy increase output the price level increases. There is a **positive relationship** between real output and the price level and to illustrate this relationship the SRAS curve slopes upwards as shown in Figure 46.1.

Figure 46.1

Explain the causes of a shift in the SRAS curve

Holding all other determinants of SRAS constant, when the price level of goods and services increases firms in the economy increase quantity supplied leading to a movement up and along the SRAS. A change in any of the determinants of SRAS other than the price level leads to a change in SRAS at each price level and a **shift** of the SRAS curve.

What are the effects on SRAS of a change in price of the factors of production?

If rents, the price of capital or the price of **raw materials** change costs of production change. The change in costs of production change the amount of profit earned at each price level thereby affecting the firms' willingness to supply. SRAS changes leading to a shift of the SRAS curve. When price of factors increase, firms reduce output at each price level and the SRAS curve shifts up and to the left. When price of factors fall firms increase output at each price level and the SRAS curve shifts down and to the right.

The effect of a change in the price of labour – a step-by-step guide

Trouble shooter

As the wage rate, which is the price of labour, rises the firms' costs of production increase.

Firms earn less profit at each price level and therefore reduce output.

The SRAS curve shifts up and to the left from $SRAS_1$ to $SRAS_3$ as shown in Figure 46.2.

A fall in the price of labour leads to a fall in the costs of production.

Firms earn more profit at each price level and therefore increase output.

The SRAS curve shifts down and to the right from $SRAS_1$ to $SRAS_2$.

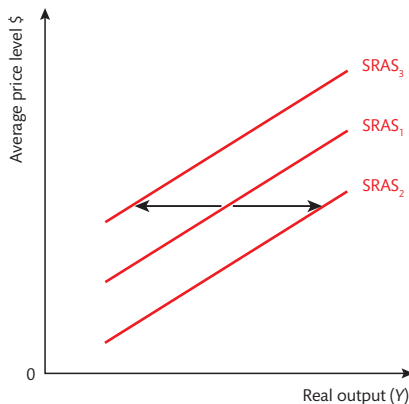


Figure 46.2

Model sentence: A change in the price of a factor of production changes the costs of production and affects firms' profitability at each price level. Therefore firms change output at each price level leading to a shift of the SRAS curve.

What are the effects on SRAS of an indirect tax and a subsidy?

In effect an indirect tax increases costs of production. Firms earn less profit at each price level and therefore reduce output and the SRAS curve shifts up and to the left.

In effect a subsidy reduces costs of production. Firms earn more profit at each price level and therefore increase output and the SRAS curve shifts down and to the right.

What is a supply-side shock?

A supply-side shock is a sudden event that affects the price of a factor of production thereby affecting costs of production. For example, in the early 1970s oil prices increased rapidly due to **conflict** in the Middle East and there was a **subsequent** restriction in the supply of oil on to the world market. Industries' costs of production rose sharply. Output of industries fell shifting the SRAS up and to the left leading to high levels of **inflation**.

A sudden fall in a country's **exchange rate** leads to an increase in the price of imports including the price of imported raw materials. As the exchange rate falls the price of imported raw materials increases thereby increasing costs of production. Firms reduce output at each price level and the SRAS curve shifts up and to the left.

The examples above are negative supply-side shocks. A positive supply-side shock leads to fall in costs of production. A sudden **technological advance** increases **productivity** and profit leading to an increase in output and a shift of the SRAS curve down and to the right.

Explain why the monetarist/new classical model of the long-run aggregate supply curve is vertical at the level of potential output

There are two **conflicting** views concerning **long-run aggregate supply**. One model is called the monetarist or new classical model; the other is called the Keynesian model named after the economist John Maynard Keynes. The differences between the **assumptions** of each model explain why the LRAS curves of each model are not the same.

Subject vocabulary

Continued from page 124

profit margin the percentage of producer revenue that ends up as profit for the firm. Profit margin = profit/producer revenue $\times 100$. If a firm earns a profit of \$20m from sales of \$80m its profit margin is 25%.

positive relationship a relationship between two variables in which one variable falls as the other falls, and increases as the other increases

raw material the basic material from which a good is made

inflation an increase in the general level of prices of goods/services in an economy over a given time period, usually a year

exchange rate the price of a country's currency in terms of another currency

technological advance an improvement in technology that leads to more efficient methods of production and an increase in productivity

productivity the quantity of output per unit of input

long-run aggregate supply the potential level of national output of a country determined by the quantity and productivity of the factors of production

Synonyms

conflict disagreement/clash

subsequent ... following/next

conflicting opposing/disagreeing

Glossary

assumption(s) something thought/believed to be true but without proof

Subject vocabulary

forces of demand and supply changes in the determinants of demand and supply in a market that affect the market price and the allocation of resources

free market a market where the forces of demand and supply are allowed to operate without any forms of intervention

resources the inputs into the production process, the factors of production

full-employment level of output the potential quantity of output that can be produced in an economy when all factors of production are employed

full capacity a situation when all factors of production are fully employed

productivity the quantity of output per unit of input

business cycle the fluctuations in economic activity over time. There are four stages of the business cycle: (1) recession, when economic activity slows down; (2) trough, when the recession is at its deepest; (3) recovery, when the economy begins to grow; and (4) peak/boom, when economic activity is high.

recession two consecutive quarters of negative economic growth

spare capacity a situation when some factors of production are unemployed

aggregate demand the total demand for goods and services in the economy at a given price level in a given period of time

negative output gap a situation in which an economy's actual output is less than its potential output

downward inflexibility occurs when the price of factors, particularly the price of labour, is slow to fall after changes in market conditions

Synonyms

distinction.... difference

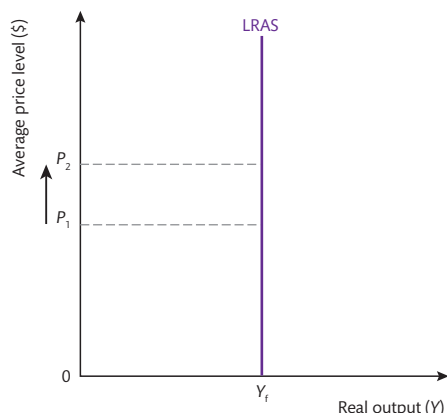


Figure 46.3

Model sentence: If the productivity of labour increases more output can be produced with the same quantity of factors. If the quantity of workers increases full employment levels of output increases. In both cases the LRAS curve shifts to the right.

Why does the Keynesian model of the aggregate supply curve have three sections? (see Figure 46.4)

No **distinction** is made between the short run and the long run under this model. Keynesians argue that there are three distinct sets of circumstances that the economy experiences as it moves through **business cycles** and that the shape of the AS curve is determined by the economy's position in the cycle.

In stage 1, output is a long way below full employment levels of output. This would occur in a **recession**. There is lots of **spare capacity**. Unemployment of all factors is high including labour and capital. It is relatively easy for firms to increase output. As the supply of the factors is high increasing demand for them does not push factor prices up. Firms are able to raise output while holding average costs constant. While this is the case the AS curve is perfectly elastic.

As output rises, in response to increases in **aggregate demand**, the **negative output gap**, which is the difference between actual output and full employment level of output, falls. As the economy enters stage 2 an increasing number of factors are employed by firms in order to increase output and the amount of spare capacity falls. Firms have to compete with each other for a smaller pool of available factors. In order to obtain them the firms must pay a higher price. This pushes up the costs of production. For example, as the demand for labour increases the price of labour, the wage rate, rises, thereby increasing costs of production. The price of raw materials rises as demand increases and rents also rise as demand for factory space increases. The price level begins to increase to cover the increasing costs of production.

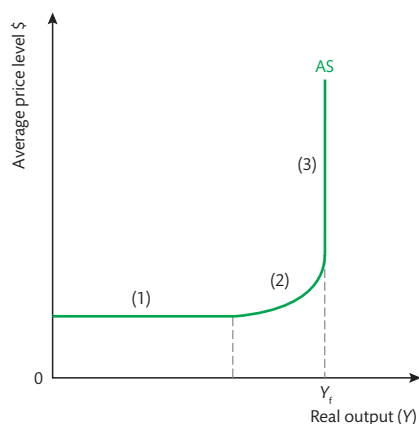


Figure 46.4

Followers of the new-classical model believe that government should not intervene in markets and that **the forces of demand and supply** operating in a **free market** should determine how **resources** are allocated.

LRAS is the level of output achieved when all factors of production are employed efficiently. This is the **full employment level of output**. The economy is operating at **full capacity**. The level of LRAS in a country is dependent on the total quantity of factors of production and the **productivity** (quality) of those factors. In this model LRAS is not dependent on the price level therefore the LRAS curve is perfectly inelastic in respect to the price level and is vertical at full employment levels of output as shown in Figure 46.3. An increase in LRAS can only be brought about through increases in the quantity and/or the productivity of the factors of production.

As AD increases firms want to raise output but find it increasingly difficult due to a lack of spare capacity. When the economy is operating at full capacity with constant productivity of the factors it is impossible to boost output beyond the full employment level of output, Y_f . At this point the AS curve is perfectly inelastic. Any increases in AD at this point results in higher price levels as AD exceeds AS. The Keynesian AS curve reflects the LRAS curve under the new classical model.

(Further analysis of the consequences of the shape of the Keynesian AS curve and of 'wage/price' **downward inflexibility** is covered on pages 128–31.)

Explain the causes of an increase in LRAS

The main causes of a change in LRAS are changes in the quantity and/or productivity (quality) of the factors of production. An increase in the quantity of land, which includes the **natural resources** found in land, leads to an increase in the potential level of output of a country. For example, if more land is taken into productive use, such as unused land put to use producing agricultural goods, then LRAS increases. If an oil field is discovered and exploited LRAS increases. Also if productivity of the land increases LRAS rises. For example, the use of new fertilizers increases output of agricultural goods from a fixed area of land.

If the quantity of labour increases through, for example, an increase in **net immigration**, an increase in the birth rate or an increase in the retirement age, LRAS increases. Increases in productivity of labour brought about by education and training also increase full employment levels of output because more output is produced by a fixed quantity of labour. Also as the population rises the number of **entrepreneurs** increase. There are more people willing to take a risk and set up business in pursuit of profit.

Investment increases the quantity of capital in the economy. More goods and services can be produced with more capital. Increases in productivity of capital comes about through advances in technology. As productivity of capital increases LRAS increases.

As the full employment level of output increases the LRAS curve in both models shifts to the right as shown in Figure 46.5.

If an economy suffers from high levels of long-term unemployment it is possible that a proportion of the potential workforce will lose their skills through lack of use. They become **deskilled** and there is a decrease in productivity leading to a shift to the left of the LRAS curve. If resources are destroyed by a natural disaster such as an earthquake or through war then LRAS falls and the LRAS curve shifts to the left. An increase in **net emigration**, particularly if those leaving the country are highly skilled, leads both to a fall in the quantity of labour and a fall in the productivity of labour causing full employment level of output to fall and the LRAS curve to shift to the left.

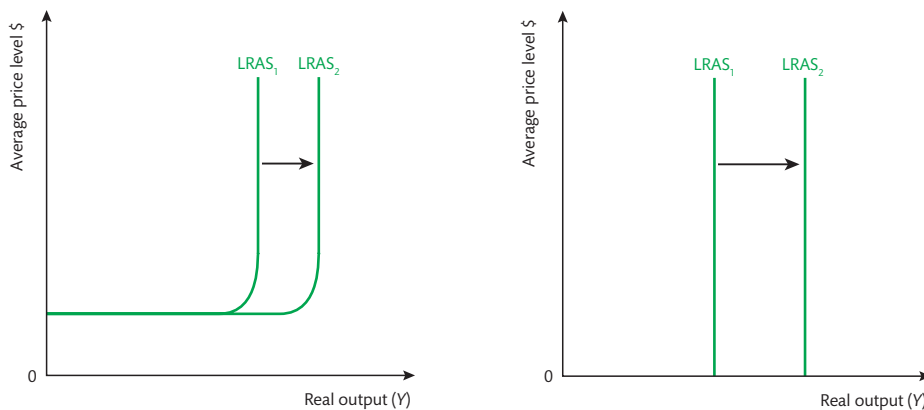


Figure 46.5

(Government plays an important role in encouraging increases in LRAS. Policies designed to affect LRAS are called supply-side policies. These are discussed in detail on pages 189–95.)

Model sentence: The quantity and quality of the factors of production are determinants of LRAS. Changes in the determinants causes a change in LRAS leading to a shift of the LRAS curve.

Test your understanding of this unit by answering the following questions

- Explain the causes of a shift of the LRAS curve.
- Explain the shape of the Keynesian AS curve.
- Why is the LRAS curve vertical at the full employment level of output?
- Explain the effect on SRAS of a supply-side shock.
- Explain the effects on SRAS of a change in price of factors of production.

Subject vocabulary

natural resources assets, such as mineral deposits and timber, that occur in nature and can be used in production

net immigration/emigration the difference between the number of people entering an area to live (usually a country) and the people leaving an area, measured over a given period of time. When more people enter than leave, net immigration is positive and net emigration is negative.

entrepreneur an individual who, in pursuit of profit, brings together the other factors of production in order to produce a good or service

investment the addition to capital stock

deskilled describes labour that has lost skills due to lack of use. Also production is deskilled when skilled labour is replaced by unskilled labour due to the introduction of new technologies.

Learning Outcomes

- Explain, using a diagram, the determination of short-run equilibrium, using the SRAS curve.
- Examine, using diagrams, the impacts of changes in short-run equilibrium.
- Explain, using a diagram, the determination of long-run equilibrium, indicating that long-run equilibrium occurs at the full employment level of output.
- Explain why, in the monetarist/new classical approach, while there may be short-term fluctuations in output, the economy will always return to the full employment level of output in the long run.
- Examine, using diagrams, the impacts of changes in the long-run equilibrium.

Subject vocabulary

aggregate demand the total demand for goods and services in the economy at a given price level in a given period of time

short-run aggregate supply SRAS shows the amount of total output firms are willing to produce and sell in an economy at each price level in a given period of time when factor productivity and factor prices are held constant

price level the current weighted average price of a selected group of goods and services produced in a country over a period of time

full-employment level of output the potential quantity of output that can be produced in an economy when all factors of production are employed

Explain the determination of short-run equilibrium and why equilibrium might change

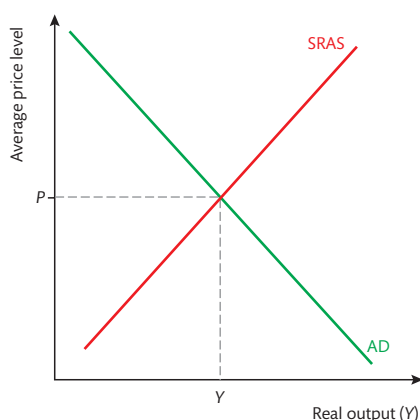


Figure 47.1

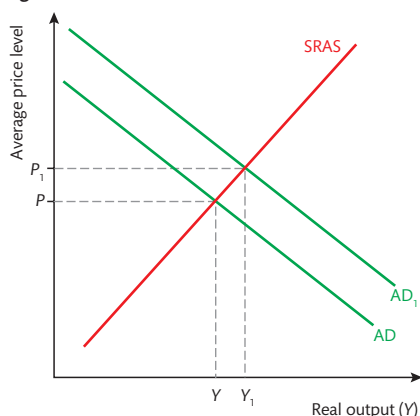


Figure 47.2

A country's economy is in equilibrium in the short run when **aggregate demand** equals **short-run aggregate supply**. This is where consumers' total demand for goods and services is equal to the total output produced by all industries in the country. There are no excesses: $AD = SRAS$.

This is shown in Figure 47.1. $AD = SRAS$ with total level of output Y at the **price level** P . At current levels of consumption there is no incentive for firms in the economy to increase or reduce output. However, a change in any of the determinants of AD or determinants of AS causes a shift of the AD or $SRAS$ curve leading to a change in the price level and a change in output.

As AD increases, say through an increase in consumer confidence, the AD curve shifts up and to the right as shown in Figure 47.2. Firms respond by increasing supply. As they do so their labour costs increase. Firms pass the increase in costs on to the consumer to pay causing an increase in the price level. Equilibrium price level and output increase to P_1, Y_1 .

Explain why, in the new classical view, the long-run equilibrium is at the full employment level of output

Followers of the new classical model argue that, as long as the markets are free from any form of intervention, particularly government intervention the economy automatically adjusts to its long-run equilibrium level of output. In Figure 47.3 initially the economy is in long-run equilibrium at the full employment level of output at P_f, Y_f where $AD = SRAS = LRAS$. A change in a determinant of AD leads to a change in the price level but the economy returns automatically to the **full employment level of output**.

Say there is a fall in consumer confidence and aggregate demand falls. The AD curve shifts down and to the left from AD_1 to AD_2 and the price level falls. Firms in the economy respond to the fall in expenditure on goods and services and the price level by reducing quantity supplied. This leads to a movement down and along the $SRAS$ curve, $SRAS_1$.

Demand for the **factors of production** is a **derived demand**. Firms demand factors because consumers demand goods and services. Therefore as AD falls the demand for factors falls leading to a fall in factor prices.

For example, demand for labour falls causing an excess supply of labour in the labour market. Therefore the wage rate falls to eliminate the excess. A fall in the price of all factors leads to a fall in the **costs of production**. Believers in the new classical model argue that if factor markets are free, if there is no form of intervention and the **forces of demand and supply** are allowed to operate freely the price of factors will instantly change when demand for them changes. Therefore costs of production immediately change.

In the example shown in Figure 47.3 the short-run equilibrium level of output, P_2, Y_1 , which is below the full employment level of output, exists momentarily. Factor prices fall instantly therefore costs of production do the same. In response, firms increase output leading to a shift down and to the right of the SRAC curve, from $SRAS_1$ to $SRAS_2$.

As the price level falls expenditure increases and there is a movement down and along the AD curve AD_2 . The economy automatically returns to the long-run equilibrium, P_3, Y_f , at the full employment level of output. The only changes brought about by the fall in aggregate demand are a fall in factor prices and a fall in the price level from P_1 to P_3 .

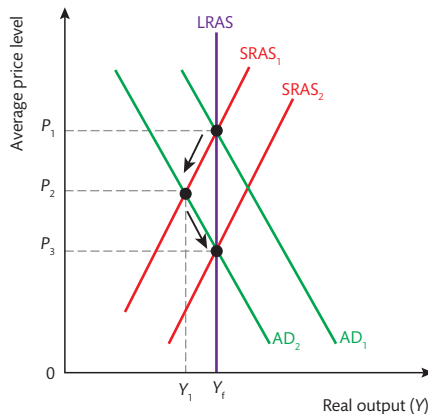


Figure 47.3

Why does the economy return to the long-run equilibrium at the full employment level of output after an increase in AD? – a step-by-step guide (see Figure 47.4)

Trouble shooter

Initially the economy is in long-run equilibrium at the full employment level of output.

AD increases and the AD curve shifts up and to the right from AD_1 to AD_2 .

As AD increases the price level rises.

Firms respond to the increase in AD and the higher price level, increasing quantity supplied by working the capital harder and paying workers overtime. There is a movement up and along the SRAS curve, $SRAS_1$.

The short-run equilibrium is P_2, Y_1 . Actual output is higher than the long-run full employment level of output.

There are no spare factors. Competition between firms for the existing factors is intense leading to an increase in factor prices.

Costs of production rise. Any increase in profit from the higher prices no longer exists; therefore firms reduce output causing the SRAS curve to shift up and to the left from $SRAS_1$ to $SRAS_2$.

As PL rises expenditure falls leading to a movement up and along the AD curve, AD_2 .

The economy automatically returns to the long-run equilibrium, P_3, Y_f , at the full employment level of output. The only change brought about by the initial increase in aggregate demand is an increase in factor prices and a rise in the price level from P_1 to P_3 .

Subject vocabulary

factors of production the inputs into the production process (land, labour, capital and entrepreneurship)

derived demand demand for a good, or factor of production, that is a consequence of the demand for something else

costs of production the amount the firm pays for the factors of production used to produce goods or services

forces of demand and supply changes in the determinants of demand and supply in a market that affect the market price and the allocation of resources

Subject vocabulary

perfectly flexible describes factor prices, such as wages, that change immediately after a change in the conditions of demand or supply

industrial action collective action, such as strikes, taken by workers, usually members of a trade union, in order to gain increases in pay and/or improved working conditions

minimum wage the minimum amount of money a firm is legally allowed to pay a worker for one hour's work

clearing rate the rate at which quantity demanded equals quantity supplied

raw material the basic material from which a good is made

resources the inputs into the production process, the factors of production

sticky downwards a factor price is described as sticky downwards when it falls very slowly in response to changes in the demand for, or supply of, the factor

deflationary (recessionary) gap the situation in which the actual output of an economy is less than its potential output

monetarist an economist who believes that economic performance is determined almost entirely by changes in the money supply

unemployment occurs when there are people actively looking for work at the equilibrium wage rate but are not able to find work

excess supply occurs when quantity supplied is greater than quantity demanded

labour market a market in which firms demand labour and workers supply labour. The interaction of demand and supply of labour determines the equilibrium wage.

Glossary

trade union(s) professional/trade organization(s) that represent workers in disputes with employers

Synonyms

deter discourage

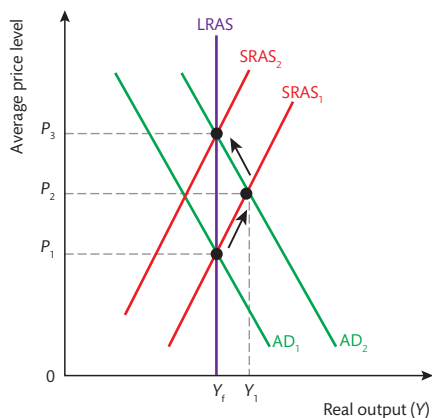


Figure 47.4

Examine the effects of changes in the long-run equilibrium

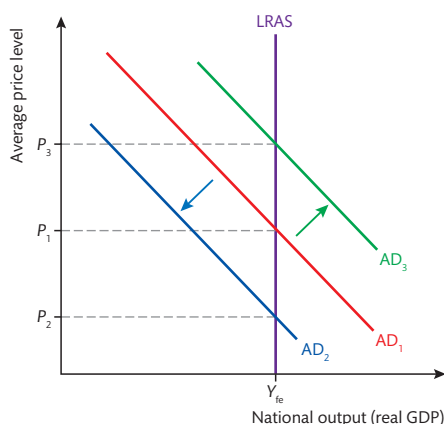


Figure 47.5

Followers of the new classical view assume that aggregate demand does not determine the level of output. They assume output and AD are unrelated. No matter what the level of total expenditure the economy always automatically returns to the long-run equilibrium at the full employment level of output. This assumption rests on the belief that factor prices are **perfectly flexible** and change immediately in response to changes in demand thereby affecting costs of production and in turn output decisions. As shown in Figure 47.5 a change in aggregate demand leads only to a change in the price of factors and a change in the price level.

Is the assumption that the economy automatically returns to the long-run equilibrium at full employment level of output realistic?

The economy only returns automatically to the long-run equilibrium at the full employment level of output after a fall in aggregate demand if factor prices are perfectly flexible. If prices are perfectly flexible when demand falls for the factors of production factor prices fall immediately to clear the markets. However, there are factors that restrict the drop in price.

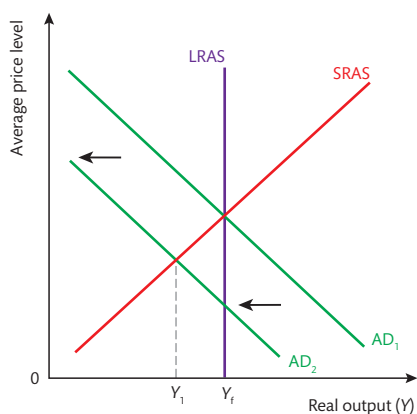


Figure 47.6

A firm hiring a workshop has a contract with the owner agreeing to pay a certain rent each month. Therefore rents will not fall straight away in response to a fall in demand for the workshops. Workers have contracts of employment. Firms cannot cut wages immediately. Some industries have come to an agreement on pay with the **trade unions** representing the workers. The threat of **industrial action** could **deter** firms from cutting pay. **Minimum wage** laws mean that the price of labour cannot fall below a certain amount even if the minimum wage is higher than the **clearing rate**. Firms have reached agreements on price with, for example, suppliers of **raw materials** and energy suppliers. The prices of these **resources** do not fall straight away.

Prices are **'sticky' downwards**. When aggregate demand falls, leading to a fall in the demand for the factors of production, prices do not immediately fall to clear the market. Prices are resistant to change. The **deflationary gap** ($Y_f - Y_t$) shown in Figure 47.6 occurs when total expenditure (AD) in the economy is not enough to purchase the total output produced if all of the factors of production are employed. Some economists believe that because of interventions in the factor markets factor prices will fall but only in the long run.

Model sentence: How long a deflationary gap lasts depends on how **'sticky' downwards factor prices are**. The length of a recession is dependent on the flexibility of factor prices, particularly wages, over time.

If it is assumed that wages and other factor prices are flexible over time, eventually firms take on more workers and SRAS increases, price level falls and the economy will adjust to the long-run equilibrium at full employment level of output.

Test your understanding of this unit by answering the following questions

- Using a diagram, explain why in the new classical model, the economy automatically returns to the long-run equilibrium at the full employment level of output after a change in aggregate demand.
- Using a diagram, explain why the economy might not immediately return to the long-run equilibrium at the full employment level of output after a change in aggregate demand.

Subject vocabulary

costs of production the amount the firm pays for the factors of production used to produce goods or services

demand-deficient unemployment unemployment caused by a lack of aggregate demand. Unemployment changes as the economy goes through the business cycle, increasing when AD falls and decreasing when AD rises.

involuntary unemployment occurs when a person is willing and able to work at the given wage rate but is unable to find work

Learning Outcomes

- Explain, using the Keynesian AD/AS diagram, that the economy may be in equilibrium at any level of real output where AD intersects AS.
- Explain, using a diagram, that if the economy is in equilibrium at a level of real output below the full employment level of output, then there is a deflationary (recessionary) gap.
- Discuss why, in contrast to the **monetarist**/new classical model, the economy can remain stuck in a deflationary (recessionary) gap in the Keynesian model.
- Explain, using a diagram, that if AD increases in the vertical section of the AS curve, then there is an inflationary gap.
- Discuss why, in contrast to the monetarist/new classical model, increases in aggregate demand in the Keynesian AD/AS model need not be inflationary, unless the economy is operating close to, or at, the level of full employment.

Explain why, in the new classical view, a deflationary gap only occurs in the short run and that the economy will return to the long-run equilibrium at the full employment level of output

As **aggregate demand** falls firms reduce output and **lay off** workers. Economic theory suggests that when **unemployment** is high and demand for workers is relatively low the price of labour will fall to eliminate the **excess supply** in the **labour market**. Falling wages is an incentive for firms in the economy to employ more workers and as wages fall **costs of production** fall. In response to falling costs firms reduce prices leading to an increase in consumption of goods and services. Lower wages cures unemployment and lower prices increases consumption. The economy returns to the long-run equilibrium at the full employment level of output.

Demand-deficient unemployment or Keynesian unemployment, caused by insufficient expenditure in the economy, occurs but only in the short run. As wages and prices fall, the economy returns to full employment. The new classical view is that unemployment and lack of aggregate demand only occur in the short run. In the long run as wages fall firms demand more workers **eliminating involuntary unemployment** occurs when a person is willing and able to work at the given wage rate but is unable to find work and the economy returns to the full employment level of output. The length of time this process takes depends on how long it takes the wage rate to adjust.

In the short run wages are 'sticky' downwards. For example, employment contracts, minimum wage legislation, and pay agreements between management and **trade unions** make it impossible to cut wages very quickly. Wages are not perfectly flexible, nor are other factor prices such as rent, so costs of production do not fall quickly. Firms are unable to lower prices so consumption does not increase. Low levels of consumption and high levels of unemployment will persist until factor prices have had sufficient time to adjust. Some economists argue that such agreements on wage should be **abolished** to make wages more flexible. They argue that intervention in the labour market is the cause of unemployment and the deflationary gap.

Glossary

lay off (workers) temporarily end workers' employment due to a lack of work

trade union(s) professional/ trade organization(s) that represent workers in disputes with employers

Synonyms

eliminating... removing/ getting rid of

abolished.....banned

The return to the long-run equilibrium under the new classical model – a step-by-step guide (see Figure 48.1)

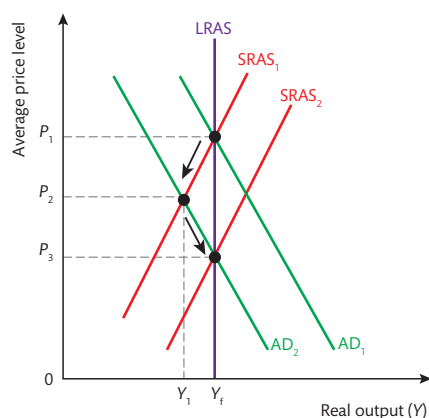


Figure 48.1

Trouble shooter

AD falls from AD_1 to AD_2 therefore firms lay off workers and unemployment rises.

Supply of labour exceeds demand therefore wage rate falls.

As wage rate falls firms employ more workers.

As costs of production fall SRAS increases and the SRAS curve shifts down and to the right.

As prices fall consumption rises: a movement down and along the AD curve AD_2 .

The economy returns to the long-run equilibrium full employment level of output.

Aggregate demand is now sufficient to buy all the goods and services produced at full employment levels of output: the deflationary gap ($Y_f - Y_1$) is eliminated.

Explain why, in the Keynesian model, the actual macroeconomic equilibrium can be below full employment level of output and that the economy can be stuck in a deflationary gap

Model sentence: Keynesians argue that high levels of unemployment can persist for a long time because of the lack of aggregate demand. It is low levels of expenditure that causes unemployment not inflexible factor markets.

Subject vocabulary

recession two consecutive quarters of negative economic growth

investment the addition to capital stock

demand-side policy policy designed to affect aggregate demand

economic growth an increase in real GDP

Glossary

bankrupt stopped trading permanently due to a lack of money

Synonyms

advocates..... supporters

Even if wages fall, Keynesians argue, firms will not employ more workers in order to increase output because of insufficient demand for goods and services. **Recessions** are characterized by falling levels of expenditure. Consumer spending and business **investment** both fall. Unemployment increases, demand falls further, and firms go **bankrupt**. AD falls even further and a cycle of falling spending and investment follows leading to increasing levels of unemployment. Unemployment is caused by a lack of aggregate demand in the economy.

Model sentence: The solution to unemployment, Keynesians argue, is to boost aggregate demand leading to increases in supply and falls in unemployment. Output is determined by demand.

Keynesians believe that a recession, without government intervention, could be deep and long leading to high levels of long-term unemployment of labour and persistent low levels of expenditure. Keynesians argue that equilibrium levels of output are determined mainly by the strength of AD. Therefore the government should implement **demand-side policies** that increase AD. In response firms then employ more factors in order to increase output. Keynesians are interventionists, believing that the government has a key role to play in managing AD so that the macroeconomic objectives such as low unemployment and **economic growth** are achieved.

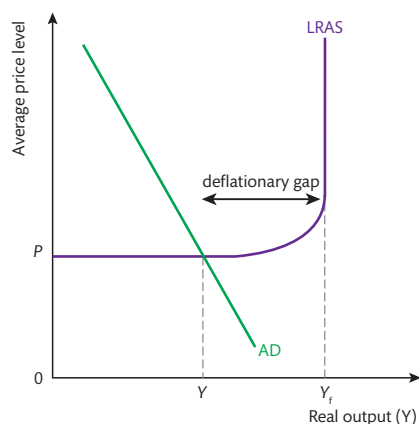


Figure 48.2

Figure 48.2 shows an economy where there is a deflationary gap ($Y_f - Y$), which occurs when total expenditure (AD) in the economy is not enough to purchase the total output produced if all of the factors of production are employed. Keynesians argue that the deflationary gap can persist for many years unless consumption increases. Whereas **advocates** of the new classical model believe factor prices will adjust in the short run and the economy will return to the long-run equilibrium at the full employment level of output.

Explain why, in the new classical model, an increase in aggregate demand causes an inflationary gap and the price level to rise

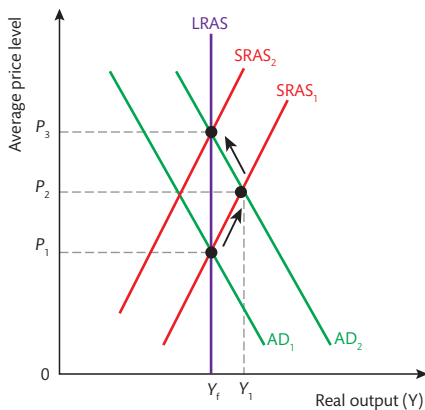


Figure 48.3

Firms want to increase output and demand more **factors of production** in order to do so. As demand rises in the factor markets, factor prices, including the wage rate, increase in order to eliminate the **shortages**. Costs of production therefore rise and **short-run aggregate supply** falls causing the SRAS curve to shift up and to the left from $SRAS_1$ to $SRAS_2$. Firms pass on the higher costs to the consumers to pay and the price level rises from P_2 to P_3 . This is called **cost-push inflation**. The result of the increase in AD is that consumers pay higher prices for the same output of goods but workers now earn higher wages to compensate.

Model sentence: An increase in aggregate demand beyond the long-run equilibrium full employment level of output increases costs of production causing both demand-pull and cost-push inflation.

Explain why, in the Keynesian model, an increase in aggregate demand does not always cause inflation

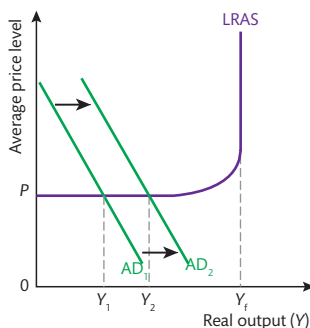


Figure 48.4

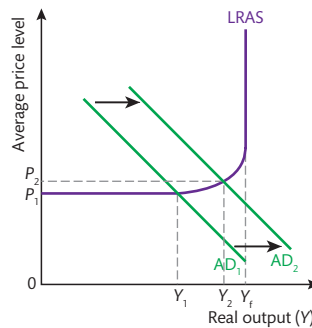


Figure 48.5

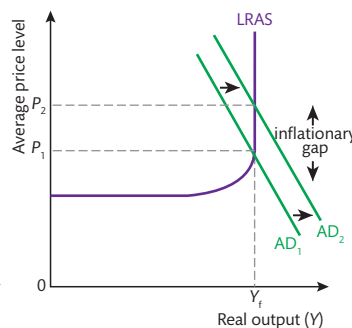


Figure 48.6

In Figure 48.4 the economy is in equilibrium at price level P and actual real output Y_1 . There is a relatively large deflationary gap ($Y_f - Y_1$). This means that total expenditure is not sufficient to buy all of the full employment level of output Y_f . There are many unemployed factors so that in the factor markets supply exceeds demand. As expenditure rises and AD shifts from AD_1 to AD_2 firms respond by employing more factors, including labour, which are added to the fixed **capital** in order to increase output. **Real output** in the economy rises from Y_1 to Y_2 . Although there is an increase in demand for the factors, the prices in the factor markets do not rise because there is so much **spare capacity**. Costs of production do not increase therefore inflationary pressure does not build up. Also firms are reluctant to raise prices because levels of AD are still relatively low and price competition is more intense.

As expenditure continues to increase, as shown in Figure 48.5, the AD curve shifts up and to the right from AD_1 to AD_2 and real output rises from Y_1 to Y_2 reducing the deflationary gap. The demand for factors continues to rise, including demand for labour, in order to increase output in response to higher expenditure. At this stage in the **business cycle** the economy has moved out of recession and is now experiencing rising levels of aggregate demand and increasing levels of real output. Demand for all factors continues to rise. There is now less spare

Subject vocabulary

inflationary gap the amount by which actual output exceeds potential output when factors are fully employed

long-run aggregate supply the potential level of national output of a country determined by the quantity and productivity of the factors of production

demand-pull inflation occurs when aggregate demand is greater than aggregate supply

factors of production the inputs into the production process (land, labour, capital and entrepreneurship)

shortage when quantity demanded is greater than quantity supplied (another term for excess demand)

short-run aggregate supply SRAS shows the amount of total output firms are willing to produce and sell in an economy at each price level in a given period of time when factor productivity and factor prices are held constant

cost-push inflation inflation caused by an increase in the costs of production, resulting in a decrease in aggregate supply

capital (goods) manufactured goods that are used in the production of other goods

real output the quantity of goods and services produced in a given time period

spare capacity a situation when some factors of production are unemployed

business cycle the fluctuations in economic activity over time. There are four stages of the business cycle: (1) recession, when economic activity slows down; (2) trough, when the recession is at its deepest; (3) recovery, when the economy begins to grow; and (4) peak/boom, when economic activity is high.

Subject vocabulary

productivity the quantity of output per unit of input

aggregate demand the total demand for goods and services in the economy at a given price level in a given period of time

capacity so as demand in the factor markets increases factor prices start to rise, including the price of labour. Firms' costs of production increase and they pass at least some of these higher costs on to the consumer to pay. The price level rises from P_1 to P_2 .

In Figure 48.6 the economy is in long-run equilibrium (P_2, Y_f) at the full employment level of output. As expenditure increases the AD curve shifts up and to the right from AD_1 to AD_2 . The economy enters the boom phase of the business cycle. With the given quantity and quality (**productivity**) of the factors of production it is not possible for the economy to raise output. All factors are employed. Therefore as AD rises real output remains constant. **Aggregate demand** exceeds aggregate supply. More expenditure is chasing the same quantity of goods and services therefore prices must rise to allocate them. There is an inflationary gap meaning the increasing level of expenditure cannot be satisfied by the existing factors of production.

Model sentence: In the Keynesian model the effect on the price level and real output of an increase in expenditure is dependent upon the amount of spare capacity in the economy. As AD continues to rise demand for factors increases and inflationary pressures build up.

Test your understanding of this unit by answering the following questions

- Explain why, in the new classical model, the deflationary gap occurs only in the short run. Use a diagram to illustrate your answer.
- Explain why, in the Keynesian model, increases in aggregate demand will not always cause the price level to rise. Use a diagram to illustrate your answer.
- Explain the terms deflationary gap and inflationary gap.
- Why are wages not perfectly flexible?

Learning Outcomes

- Explain, with reference to the concepts of leakages (withdrawals) and injections, the nature and importance of the Keynesian multiplier. (HL)
- Calculate the multiplier using either of the following formulae: $\frac{1}{1 - MPC}$ or $\frac{1}{MPS + MPT + MPM}$ (HL)
- Use the multiplier to calculate the effect on GDP of a change in an injection in investment, government spending, or exports. (HL)
- Draw a Keynesian AD/AS diagram to show the impact of the multiplier. (HL)

Subject vocabulary

marginal propensity to consume is the proportion of additional income that an individual spends on goods and services. $MPC = \frac{\text{change in consumption}}{\text{change in income}}$

average propensity to consume the percentage of income that is spent on goods and services. Calculated by dividing average household consumption by average income per head.

Synonyms

consumption use

What is the marginal propensity to consume (MPC)?

Aggregate demand = **consumption** + investment + government expenditure + net exports. Consumption is one of the components of AD. It signifies expenditure on domestically produced consumer goods and services in the economy in a given period of time. The factors that determine the level of aggregate demand are discussed on pages 119–23.

The amount of income is the most significant factor determining the level of consumption.

Model sentence: As income increases consumption increases. The extent of the increase in consumption is measured by the **marginal propensity to consume**. It is the proportion of an increase in income that is spent on domestically produced consumer goods and services.

$$MPC = \frac{\text{change in consumption}}{\text{change in income}}$$

A household's income rises from £2000 per month to £2500 leading to an increase in consumption of £300 per month the $MPC = £300/£500 = 0.6$. Each household has a different MPC. Some households will save all the extra income, some will spend all the extra income and others will spend only some of it.

The government calculates the **average propensity to consume** (APC) so that it is able to assess the effect on consumption of a rise or fall in national income.

$$APC = \frac{\text{consumption}}{\text{income}}$$

Say national income of a country is \$120 billion and the $APC = 0.7$

$$0.7 = \frac{\text{consumption}}{\$120 \text{ billion}}$$

Consumption = $0.7 \times \$120 \text{ billion} = \84 billion

Explain the terms the marginal propensity to tax (MPT), the marginal propensity to save (MPS), and the marginal propensity to import (MPM) and describe how they affect the marginal propensity to consume (MPC)

The proportion of any extra income available for consumption of domestically produced goods and services depends on the proportion of the extra income that is taxed, saved, or spent on imports. Income that is taxed, saved, or spent on imports is a leakage of income out of the **circular flow of income model** (see pages 107–109 for a detailed explanation of the circular flow of income model).

The **marginal propensity to tax** (MPT) is the proportion of additional household income which is taxed, by the government. The tax revenue goes to the government, some of which is injected back into the circular flow through government expenditure. *Ceteris paribus*, as MPT increases MPC falls.

The **marginal propensity to save** is the proportion of an increase in income that is saved by households. Savings, which includes income used to pay back existing debt, are leakages out of the circular flow of income model. Income flows from households to the **financial sector** and is injected back into the economy when firms borrow to **invest**. **Interest rate** is the reward for saving. The incentive to save increases as interest rate rises. *Ceteris paribus*, as the interest rate increases the MPS increases leading to a fall in the MPC.

The **marginal propensity to import** is the proportion of additional income that is spent on **imported goods** and services. Expenditure on imports is a leakage out of the circular flow of income. The income goes to firms abroad and then flows to the foreign households. As MPM increases, *ceteris paribus*, MPC falls.

All household income is either spent on domestically produced goods and services, saved, taxed, or spent on imports. Therefore $MPC + MPS + MPT + MPM = 1$. Savings, taxes, and expenditure on imports are leakages from the circular flow of income. Another term for leakages is withdrawals. The collective name for $MPS + MPT + MPM$ is the **marginal propensity to withdraw** (MPW): $MPW = MPS + MPT + MPM$. As shown above $MPC + MPS + MPT + MPM = 1$. Therefore $MPW + MPC = 1$. When MPW and MPC are added together they always equal 1 therefore an increase in MPW leads to a fall in MPC.

Model sentence: A change in the marginal propensity to withdraw leads to a change in the marginal propensity to consume.

What is the Keynesian multiplier and what is its impact on national income? (UL)

Investment by firms, government expenditure, and expenditure on **exports** are all injections into the circular flow. The following example highlights the overall effect on national income of an injection into the circular flow of income. A government invests €100 million building new hospitals. The money goes to firms in the economy. For example, the money flows to the many firms involved in the construction of the buildings, to firms who make the carpets, the blinds and curtains, the beds, the floor and wall tiles, the office desks and chairs, the computers, the medical capital equipment, and so on. There are lots of firms involved in the provision of hospitals and all get a share of the €100 million.

Government expenditure is a component of aggregate demand. In this case there is an initial increase in expenditure of €100 million. In order to produce output firms must hire the factors of production from households. They pay wages for labour, rent for land, interest for capital, and profit for entrepreneurship. Wage, rent, interest, and profit are the four components of income.

€100 million flows from the government to the firms. €100 million then flows from the firms to households as payment for the use of the factors. Household incomes rise by €100 million. The proportion of the extra €100 million of income that is spent on **domestically produced goods and services** is dependent on the MPC and the MPW. If the MPW in the country is 0.4 (the addition of $MPS = 0.1$, $MPT = 0.1$, $MPM = 0.2$) then MPC must be 0.6. Therefore, 0.4 of the additional income, which is €40 million, leaks out of the circular flow as savings, taxes, and expenditure on imports and 0.6 of the additional income, which is €60 million, is spent on domestically produced goods. €60 million flows from households to firms in the economy. It then flows back to households as payments for the use of the factors. Household incomes increase by €60 million. 0.4 of the €60 million, which is €24 million, leaks out, and 0.6 of the €60 million, which is €36 million, is spent on domestically produced goods and services. €36 million flows from households to firms and then back to households for payments of the factors. This process continues until the remains of the initial government expenditure available for consumption falls to zero.

National income initially increases by €100 million but further rounds of household expenditure brought about by the initial government expenditure means that eventually the total increase in income is greater

Subject vocabulary

circular flow of income an economic model that shows the flow of money between households and firms and, in more complex versions, the flows of money into and out of the financial sector, government sector, and the international sector

marginal propensity to tax the rate at which additional income is taxed

marginal propensity to save the proportion of additional income that an individual saves. $MPS = \frac{\text{change in savings}}{\text{change in income}}$

financial sector the part of the economy which includes the financial institutions (banks, building societies, insurance companies, and stock market), which allow for the flow of financial capital and the extension of credit

invest to buy capital goods and services

interest rate the percentage amount charged by a lender for money borrowed

marginal propensity to import the proportion of additional income that an individual spends on imported goods and services. $MPM = \frac{\text{change in expenditure on imports}}{\text{change in income}}$

imported goods goods sold into a country from another country

marginal propensity to withdraw is the proportion of additional household income that is taxed, saved and spent on imports. $MPW = MPT + MPS + MPM$

investment the addition to capital stock

exports goods produced in one country that are sold into another country

domestically produced goods goods produced within one's own or a specified country

services products that cannot be seen or touched, such as a train journey and car insurance

national income the sum of all income earned in a country in a given period of time

Subject vocabulary

autonomous expenditure spending not affected by the level of income of the four macroeconomic sectors: households, government, business, and foreign.

the multiplier the number by which the value of the expenditure is multiplied to give the total increase in national income. The multiplier = $1/(1-MPC)$

unemployment occurs when there are people actively looking for work at the equilibrium wage rate but are not able to find work

capital (goods) manufactured goods that are used in the production of other goods

induced investment investment by firms that is caused by increases in consumption. As aggregate demand increases, and is forecast to continue to rise, firms need to increase the quantity of capital in order to meet future levels of demand.

demand-pull inflation occurs when aggregate demand is greater than aggregate supply

aggregate demand the total demand for goods and services in the economy at a given price level in a given period of time

aggregate supply the total supply of goods and services produced in an economy at a given price level in a given time period

than the initial injection of €100 million. In this example $MPC = 0.6$ and the **autonomous expenditure** is €100 million. This causes further rounds of expenditure of €60 million + €36 million + €21.6 million + €12.96 million + €7.77 million + €4.67 million + €2.8 million, and so on. Income continues to leak out of the circular flow so eventually there is nothing left of the government expenditure of €100 million.

Explain how to calculate the multiplier (HL)

The **multiplier** is the number used to multiply the autonomous expenditure by in order to work out the overall change in national income from the injection into the circular flow. A government can assess the effect on national income of investments by firms, government expenditure, and expenditure on exports, by applying the multiplier. The following formulae are used to work out the multiplier.

$$\frac{1}{(1-MPC)} \text{ or } \frac{1}{MPS+MPT+MPM}$$

In the previous example the initial or autonomous expenditure is €100 million. $MPC = 0.6$, $MPS = 0.1$, $MPT = 0.1$, $MPM = 0.2$. Therefore $MPW = 0.4$.

$$\frac{1}{(1-MPC)} = \frac{1}{(1-0.6)} = \frac{1}{0.4} = 2.5$$

$$\text{Or } \frac{1}{MPS+MPT+MPM} = \frac{1}{0.1+0.1+0.2} = \frac{1}{0.4} = 2.5$$

The multiplier = 2.5

To calculate the overall effect on national income of an autonomous expenditure of €100 million, the autonomous expenditure is multiplied by the 'multiplier'.

$$€100 \text{ million} \times 2.5 = €250 \text{ million}$$

The autonomous expenditure of €100 million leads to an increase in income not of €100 million but of €250 million.

The multiplier can be used to calculate the increase in national income from any injection in to the circular flow whether it is investment by firms, government expenditure, or expenditure on exports.

Model sentence: An increase in the marginal propensity to consume leads to an increase in the multiplier. Therefore the higher the MPC the greater will be the total increase in national income brought about by autonomous expenditure.

Using an AD/AS diagram show the impact on AD of the multiplier and discuss its significance (HL)

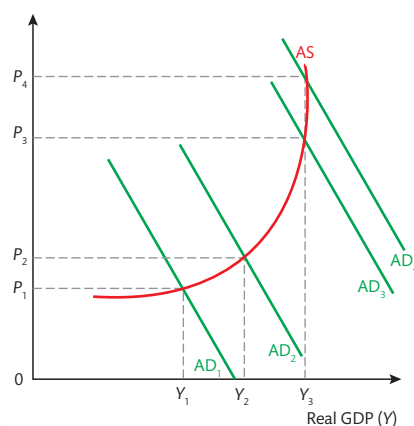


Figure 49.1

Keynesians believe the government should increase government expenditure in order to increase aggregate demand thereby increasing output and lowering **unemployment**. They argue that the impact on AD is significantly affected by the multiplier. AD will rise much further.

Increasing consumption induces firms to invest in more **capital** so that firms can increase supply and keep up with growing demand. **Induced investment** is an injection into the circular flow and is also subject to the multiplier. In this way AD continues to increase, output and incomes rise, and unemployment falls. As unemployment falls AD rises even further. Figure 49.1 shows AD increasing. The larger the multiplier the greater the impact on AD of injections into the economy and the larger the shift up and to the right of the AD curve.

However, this policy can cause **demand-pull inflation** when **aggregate demand** begins to exceed **aggregate supply**.

When the economy is in a **recession** with low levels of expenditure, income and output **tax revenues** are low. The government must borrow from the financial institutions in order to increase government expenditure. **Interest payments** on an increasing **national debt** will grow. Future tax-payers will have to pay back the debt from their income thereby affecting future levels of expenditure.

It is very hard for the government to work out the value of the multiplier. It is not certain that an accurate figure can be worked out given all the possible variables that affect its size. There are changes in the economy that occur that affect the size of the multiplier from one year to the next. For example, changes in expectations about the future state of the economy lead to changes in households' propensity to save and to consume. If households are pessimistic about future economic prospects they are likely to pay back more personal debt rather than consume more when incomes increase.

If the exchange rate increases the price of imports falls leading to an increase in quantity demanded. The marginal propensity to import increases leading to a fall in MPC and therefore a fall in the size of the multiplier.

The impact on national income of the multiplier is not immediate. It takes time for the further rounds of consumption to take place. There are significant **time lags** between the autonomous expenditure and increases in income and expenditure. And during these time lags economic conditions affecting MPC and the size of the multiplier change.

Test your understanding of this unit by answering the following questions

- What is MPC?
- Explain the factors that affect the size of the Keynesian multiplier.
- Explain the impact of the multiplier on the change in national income brought about by increases in government expenditure. Use an AD/AS diagram to illustrate your answer.
- How might changes in expectations, the exchange rate, interest rates, and the rate of tax affect the size of the multiplier?

Subject vocabulary

recession two consecutive quarters of negative economic growth

tax revenue the income the government receives through the levying and collection of taxes

interest payments the money paid at regular intervals on loans

national debt the total amount of money a government has borrowed. When a government runs a budget deficit it must borrow the difference thereby adding to the national debt

Glossary

time lag(s) period(s) of time between two linked events